

Water in the Air

Weather

- the condition of the atmosphere at a certain time or place
- Affected by the amount of water in the air

Water Cycle

The continuous movement of water:

From

Sources on Earth's surface (Ex. Rivers, oceans and plants)

To

The Air (water vapor through evaporation)

Onto and Over
Land (Precipitation)

Into

The Ground (Ground water)

And Back To

The Earth's Surface (rivers, oceans and plants)

Humidity

The amount of water vapor in the air

The air can only hold so much water vapor at a given time

As the temperature increases the amount of water vapor air can hold increases.

This is because the increase in heat spreads the air's molecules apart and opens space

How It Affects Us

- Makes weather seem hotter than it actually is
- Makes summer days in August sticky, hazy and uncomfortable
- Makes hair frizzy

- Causes cool glasses, cans and bottles to “sweat”
- Makes breathing harder for the old or those who already have health problems

When controlled in a closed area

- Keeps Cigars fresh
- Helps clear sick people's congestion

Relative Humidity

- How much water vapor is in the air compared to how much water vapor the air can hold at a certain temperature
- Its given in percentages
- Formula:
- **(Actual Amount of Water Vapor)**
(How Much Water Vapor the Air Could Actually Hold)

X100

Ex. The air at a certain temp can hold 24 g of water vapor. At this time it is holding 18 g. What is the relative humidity?

$$\frac{18 \text{ g}}{24 \text{ g}} \times 100 = 75 \%$$

Find the relative Humidity for the Following Problems

1. At 40 degrees Celsius, air can hold 50 g of water vapor. Right now it is holding 48 g.
2. At 20 degrees Celsius the air can hold 15 g of water vapor. Right now it is holding 5 g.

3. At 30 degrees Celsius the air can hold 25 g of water vapor. Right now it is holding 20 g.

Factors affecting relative humidity

- amount of water vapor
- temperature

Question

If the amount of humidity stays the same and the temperature decreases the relative humidity percentage increase.

If the amount of humidity stays the same and the temperature increases the relative humidity percentage decreases.

Why does this occur?

Condensation

- the process by which water vapor changes into a liquid
- can only happen if the air is completely saturated- 100% relative humidity
- When the saturated air cools, liquid is formed
- Must have a cool surface to condense on

Dew Point

- the temperature at which a gas condenses into a liquid
- At this temperature, the air is completely saturated and just needs a cool surface so it can condense.

Label each example as condensation, evaporation or precipitation

1. Leaves water rings on tables
2. Removes puddles
3. Causes floods
4. Requires heat
5. Requires the removal of heat
6. Type is based on temperature
7. Will not occur at 100% humidity
8. Is responsible for cloud formation
9. Causes dripping from air conditioners
10. Can be measure most accurately